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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/677,698 09/28/00 NAIR

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MMC2/1105
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EXAMINER

RAO, S

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 11/05/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/677,698

Applicant(s)

NAIR ET AL.

Examiner

Steven H. Rao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 8-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-7 and 15-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-7 and 15-19, are drawn to an apparatus i.e. a Mos transistor device, classified in class 257, subclass 412
- II. Claims 8-14 are drawn to a method for shifting a flat band MOS transistor classified in class 438, subclass 305.

The inventions are distinct, each from the other because:

Inventions Group I and II are related as process of making and product made.

The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the process as claimed can be used to make other and materially different product namely a BiCMOS or other memory devices.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

During a telephone conversation with John Patrick Ward (Reg. No. 40,216) @ (408)720-8300 on 10/18/2001 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-7 and 15-19. Affirmation of this election must be made by applicant in replying to this Office action.

Claims 8-14 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 112

Claims 1-7 and 15 -19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2-4 and claims 9-11 all recite, " gate area material." It is not clear whether applicants' mean the gate electrode or the area surrounding the gate by this recitation.

If applicants mean the gate electrode than replacing the phrase "gate area material" with gate electrode may overcome the rejection.

Appropriate correction is required.

Applicant is advised that should claims 1-7 be found allowable, claims 15-19 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected , under 35 U.S.C. 103(a) as being unpatentable over Stein et al. (U.S. Patent No. 4,055,837, herein after Stein).

With respect to claim 1, Stein describes an apparatus (device) including : a MOS transistor (fig. 1 31 , col. 2 lines 7-8) with a shifted band flat band magnitude (col. 7 lines 32-35) ; a gate electrode coupled to the MOS transistor (fig. 2 # 13 that acts both a source for transistor 1 and electrode for MNOS capacitor and is electrically connected, col. 2 lines 46-48).

Stein does not specifically state the gate electrode is connected to a positive voltage electrode .

However, it would be obvious to one of ordinary skill in the art at the time of the invention that all transistors in order to turn on the transistor (e.g. enhancement mode devices) has to be connected to a positive voltage source to provide an voltage greater than the threshold voltage of the transistor (device) to turn it on.

Therefore it would be obvious to one of ordinary skill in the art to apply the knowledge of one ordinarily skilled in the art, namely a transistor has to be connected to a positive voltage source greater than threshold voltage to turn it on with Stein's transistor so that Stein's transistor can be turned on.

The source electrode, the drain electrode and the substrate electrode coupled to each other and to a negative voltage source [Stein fig. 2 # 31,13 and 5 coupled to each other and ground 4 (negative voltage source)].

Claim 2 and 5-7 to the extent understood are rejected under 35 U.S.C. 103(a) as being unpatentable over Stein et al. (U.S. Patent No. 4,055,837, herein after Stein) as applied to claim 1 above and further in view of Dawson et al. (U.S. Patent no. 5,851,891, herein after Dawson).

With respect to claim 2 , Stein describes a Mos transistor.

Stein does not specifically describe the value of its gate work function.

However Dawson in col. 2 lines 48-50, describes formation of IGFETs with any desired gate work function to form devices with low gate resistivities.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to make Stein's device with any desired gate work function as described by Dawson (including those less than 0.56 volts) to form devices with low gate resistivities (Dawson col. 2 line 49).

With respect to claim 5, wherein the MOS transistor includes a heavily doped area. (Dawson col. 3 lines 40-45).

With respect to claims 6 and 7, wherein the MOS transistor includes p-channel device (cl. 6) or n-channel device(cl. 7). (Dawson col. 6 lines 61-64).

Claims 3 -4 to the extent understood are rejected under 35 U.S.C. 103(a) as being unpatentable over Stein et al. (U.S. Patent No. 4,055,837, herein after Stein) and Dawson et al. (U.S. Patent no. 5,851,891, herein after Dawson) as applied to claims 1-2 above and further in view of Howard (U.S. Patent No. 4,437,139, herein after Howard).

With respect to claim 3, Stein and Dawson describe a Mos transistor.

Stein and Dawson does not specifically mention the gate electrode being formed of platinum silicate.

However, Howard in col. 3 lines 30-34 describes a decoupling capacitor with a PtSi electrode to form a thin film capacitor having high capacitance in conjunction with low DC leakage.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include Howard's PtSi electrode in Stein and Dawson's Mos transistors in order to form a thin film capacitor having high capacitance in conjunction with low DC leakage. (Howard col. 2 lines 3-6).

With respect to claim 4, wherein the gate electrode is selected from tantalum nitrate, iridium, nickel, and arsenic (Howard col. 3 line 30-34).

With respect to claims 15-19 they essentially repeat the elements of claims 1-7.

Claim 15 repeats the elements of claim 1, claim 16 repeats the elements of claim 2, claim 17 repeats the elements of claim 3, claim 18 repeats the elements of claim 4, claim 19 repeats the elements of claim 5 and claims 15-19 are rejected for reasons stated under claims 1-5 above.

Any inquiry concerning this communication should be directed to Steven H. Rao at telephone number 703-306-5945.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703- 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703- 308-0956.

SR
10/24/01



OLIK CHAUDHURI
SUPERVISORY PATENT EXAMINER
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